

(تکلیفی ۵)

< فاصله شکافی >

(دوازدهم دفتر B)

$$y = \frac{|x|+1}{|x|-2}$$

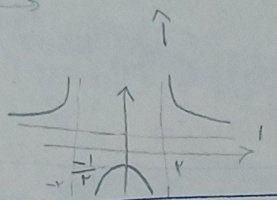
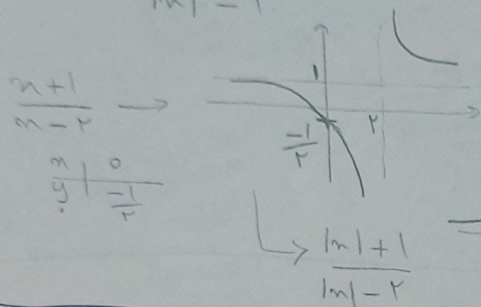
$$y = \frac{x^2+1}{|x|} = |x| + \frac{1}{|x|}$$

درجه اول همواره مثبت

$$R_f = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$$

$$R_f = [2, +\infty)$$

[1]



$$yx^2 + 2y = x^2 + 2x - 2$$

$$x^2 + (2-y)x - 2 - 2y = 0$$

$$-(2-y) \pm \sqrt{(2-y)^2 - 4(-2-2y)} \geq 0 \rightarrow y^2 + 4y + 12 \geq 0$$

$$(y+2)(y+6) \geq 0$$

[2]

$$R_f = (-\infty, -6] \cup [-2, +\infty)$$

$$y = \frac{x^2 - x + 1}{x^2 - x + 1}$$

$$yx^2 - yx + y = x^2 - x + 1$$

$$(1-y)x^2 + (y-1)x + \frac{1}{2} - y = 0$$

$$\Delta \rightarrow (y-1)^2 - 4(1-y)(\frac{1}{2}-y) = 2y^2 + 2y \geq 0$$

$$2y(y+1) \geq 0$$

[3]

$$R_f = [0, 1]$$

$$\Delta = 1 - 4(1)(1) = -3 < 0$$

پس با توجه به R است، هرگز منفی شود

$$D_f \subset R$$

$$\text{الف) } y = \sqrt{-x^2 + 4x - 1}$$

$$\left| \frac{-b}{2a} \right| \rightarrow \left| \frac{2}{-1} \right| = 2$$

اعتبار رادیکال

$$R_f = [0, \sqrt{3}]$$

$$\text{ب) } y = \sqrt{2x^2 - 8x}$$

$$\left| \frac{-b}{2a} \right| \rightarrow \left| \frac{4}{2} \right| = 2$$

$$R_f = [2, +\infty)$$

با اعتبار رادیکال

$$R_f = [2, +\infty)$$

[4]

$$\text{الف) } y = \log(x^2 - x + 1)$$

$$\log = R \rightarrow R_f = R$$

$$\text{ب) } y = \log\left(\frac{x^2+1}{x}\right)$$

$$\frac{x^2+1}{x} = x + \frac{1}{x} \xrightarrow{x>0} [2, +\infty)$$

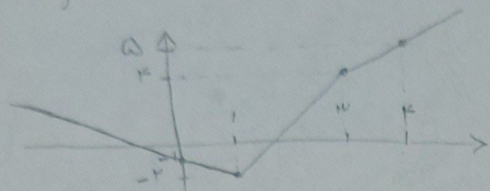
$$R_f = [1, +\infty)$$

log

[5]

الف) $y = |2x-1| - |x-1|$

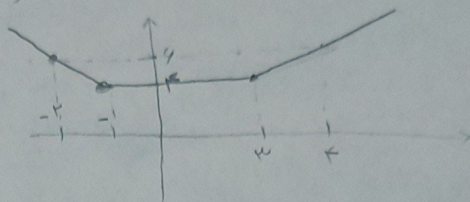
x	1	0	1	2
y	-1	1	-1	1



$R_f = [-1, +\infty)$

ب) $y = |x-1| + |x+1|$

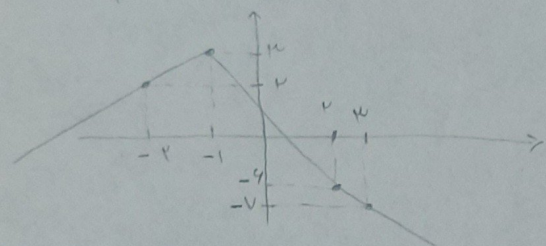
x	1	-1	-2	2
y	1	1	1	3



$R_f = [1, +\infty)$

$|x-1| - |x+1| \leq 1$

x	2	-1	0	-2
y	-1	1	-1	1

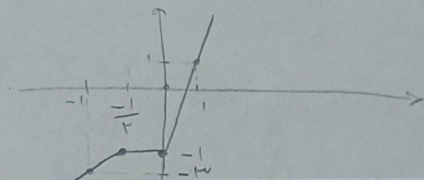


$$\begin{array}{c|c|c} x-1-x-1 \leq 1 & x-1-x+1 \leq 1 & x-1-x-1 \leq 1 \\ \hline -2 \leq 1 & 0 \leq 1 & -2 \leq 1 \\ \hline x \leq -2 & x \geq -\frac{1}{2} & x \geq 0 \end{array}$$

$(-\infty, -2] \cup [-\frac{1}{2}, +\infty)$

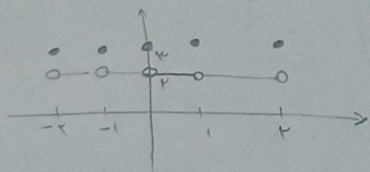
ج) $y = |x| - |x+1| + |x+1|$

x	-1	0	-1	1
y	-1	-1	-1	1



$R_f = \mathbb{R}$

الف) $y = [x] + [-x] + x$

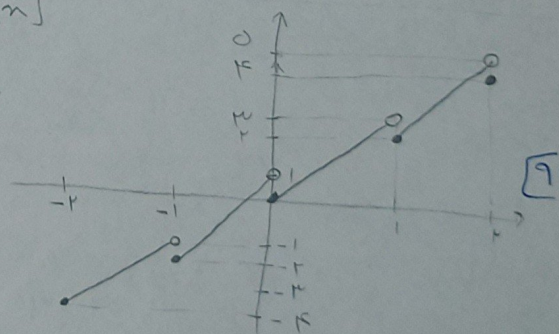


$R_f = [0, 1]$

ب) $y = [x] - [x]$

$$\begin{array}{l} x = -1 \rightarrow -1 \\ -1 < x < 0 \rightarrow [x] + 1 \\ 0 < x < 1 \rightarrow [x] \\ 1 < x < 2 \rightarrow [x] - 1 \\ x = 2 \rightarrow 2 \end{array}$$

$R_f = [-1, 2)$



الف) $\sin^2 x - \sin x + 1$

$1 \rightarrow 1 - 1 + 1 = 1$

$-1 \rightarrow 1 + 1 + 1 = 3$

$\frac{-b}{2a} = \frac{1}{2} \rightarrow \frac{1}{4} - \frac{1}{4} + 1 = \frac{3}{4}$

$R_f = [\frac{3}{4}, 3]$

$y = \sin^2 x + \sin^2 x + 1$

$1 \rightarrow 1 + 1 + 1 = 3$

$0 \rightarrow 0 + 0 + 1 = 1$

$\frac{-b}{2a} = \frac{-1}{2} \rightarrow 0$

$R_f = [1, 3]$